



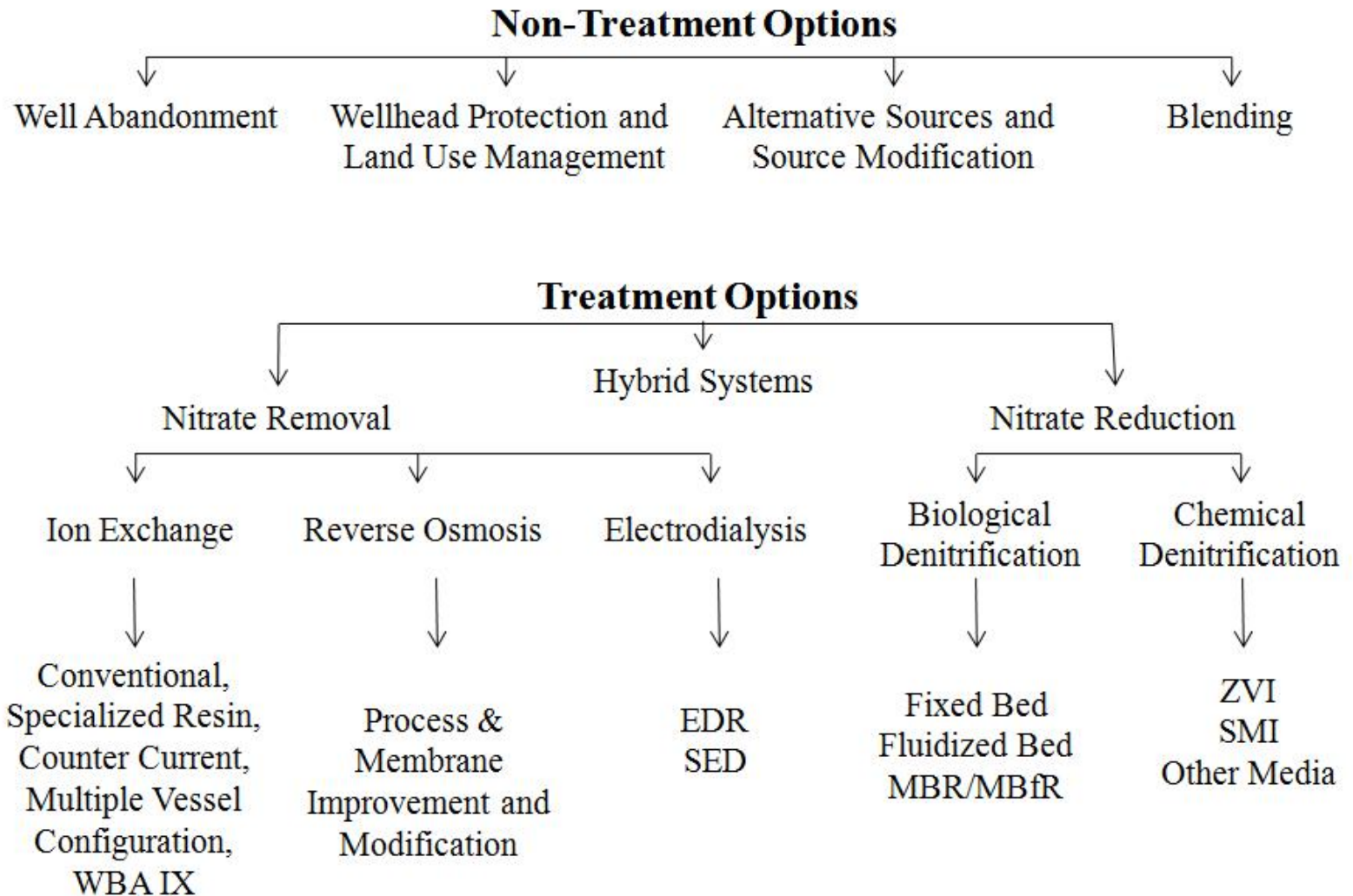
# Other Nitrate Treatment Technologies

**Jacobs Engineering Group Inc.**

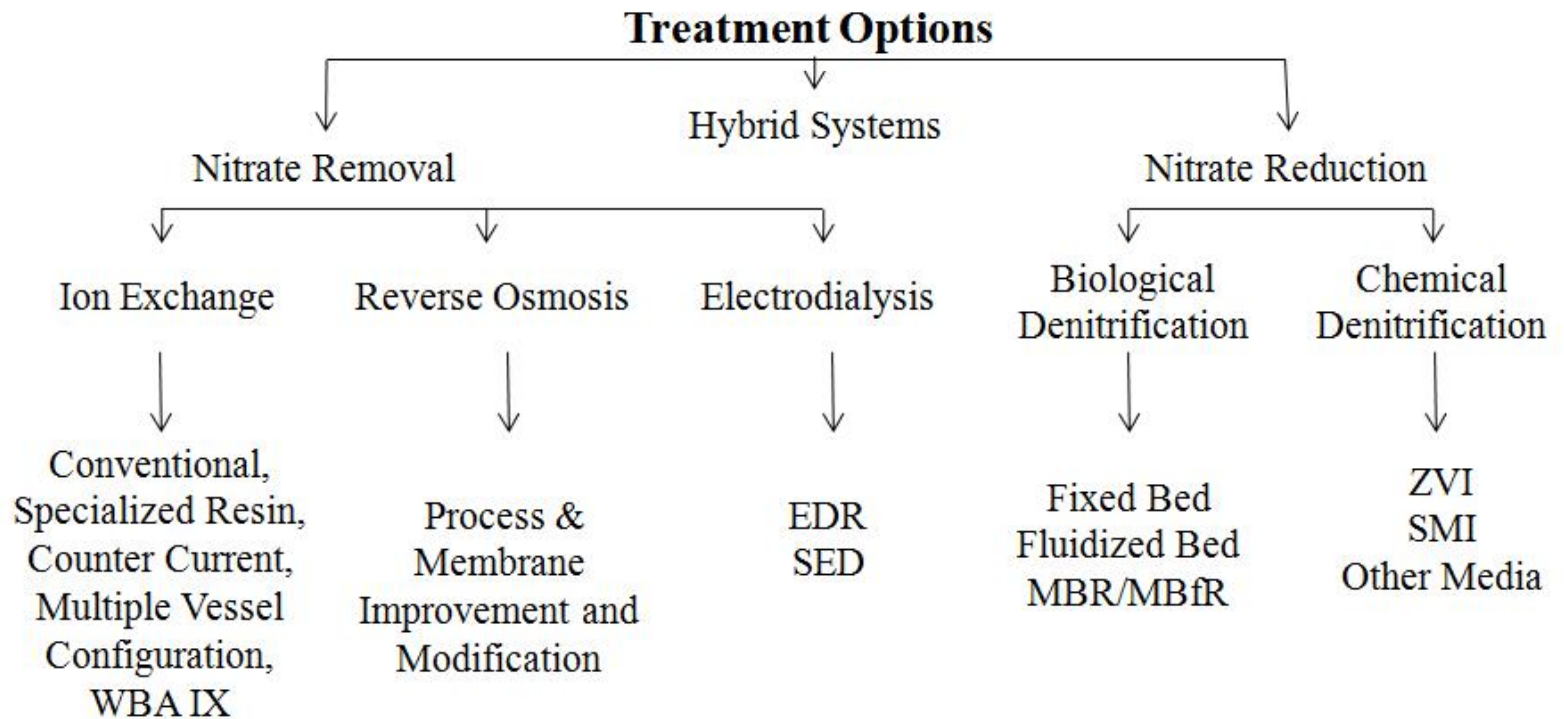
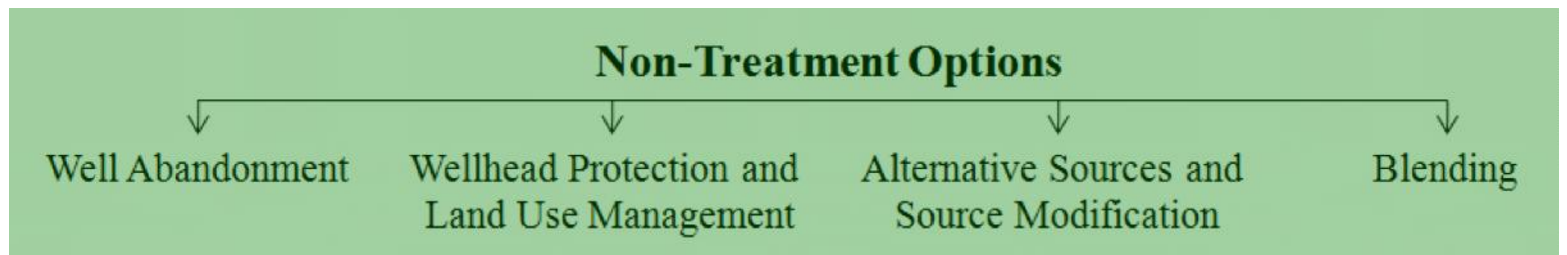
**Chad Seidel, Ph.D., P.E.**

**JACOBS®**

# Summary of Nitrate Management Options

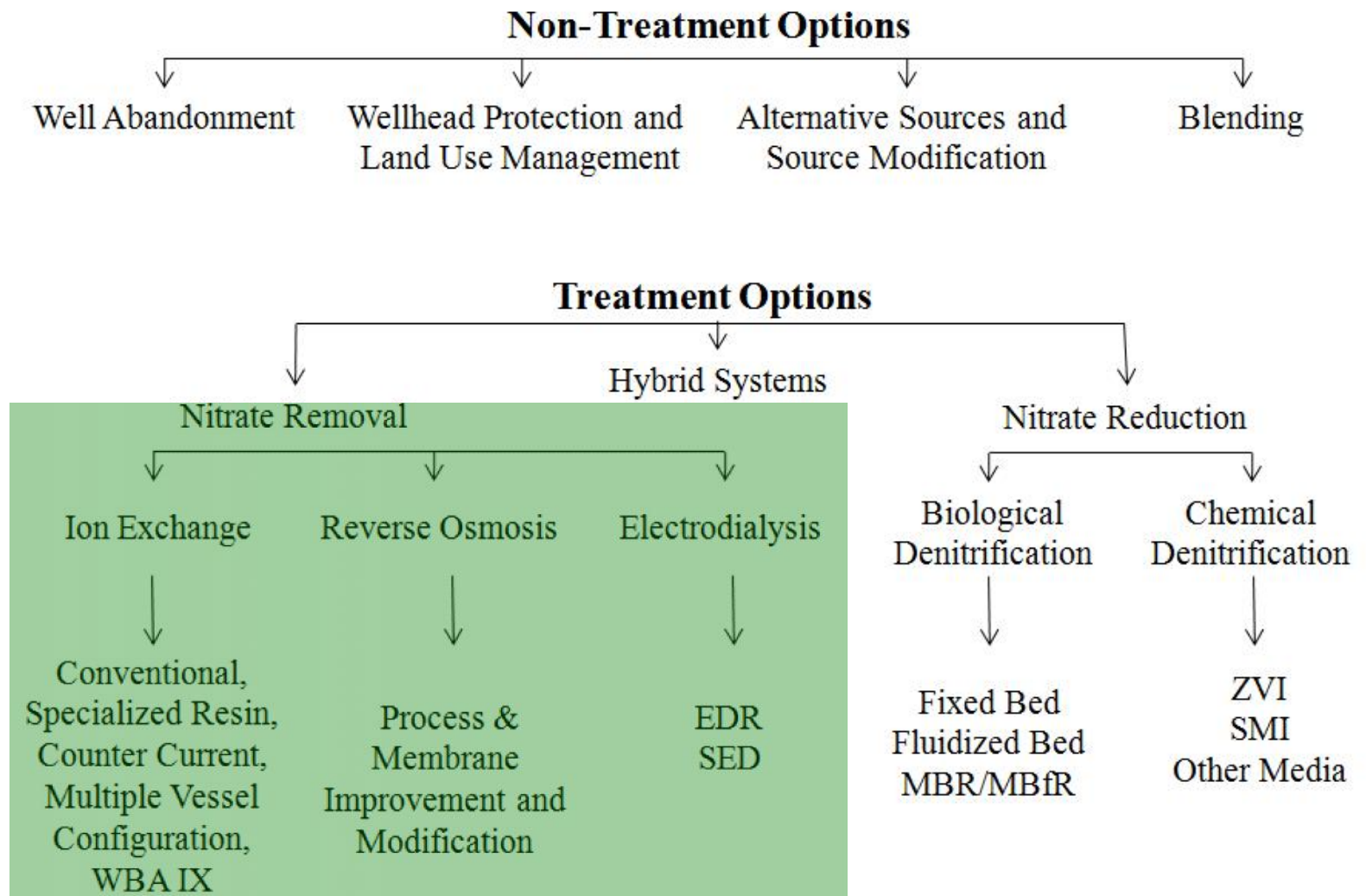


# Non-Treatment Options

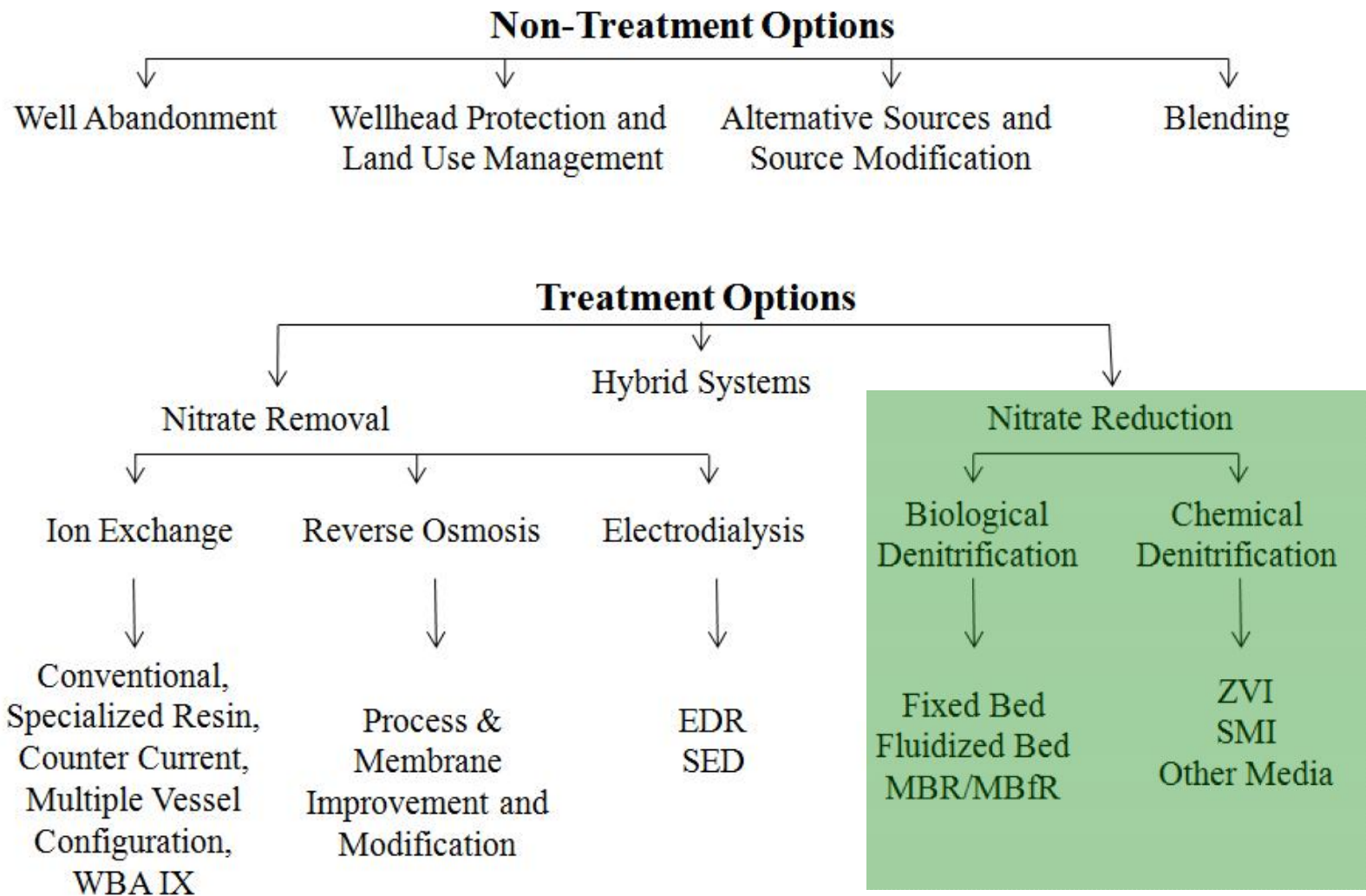




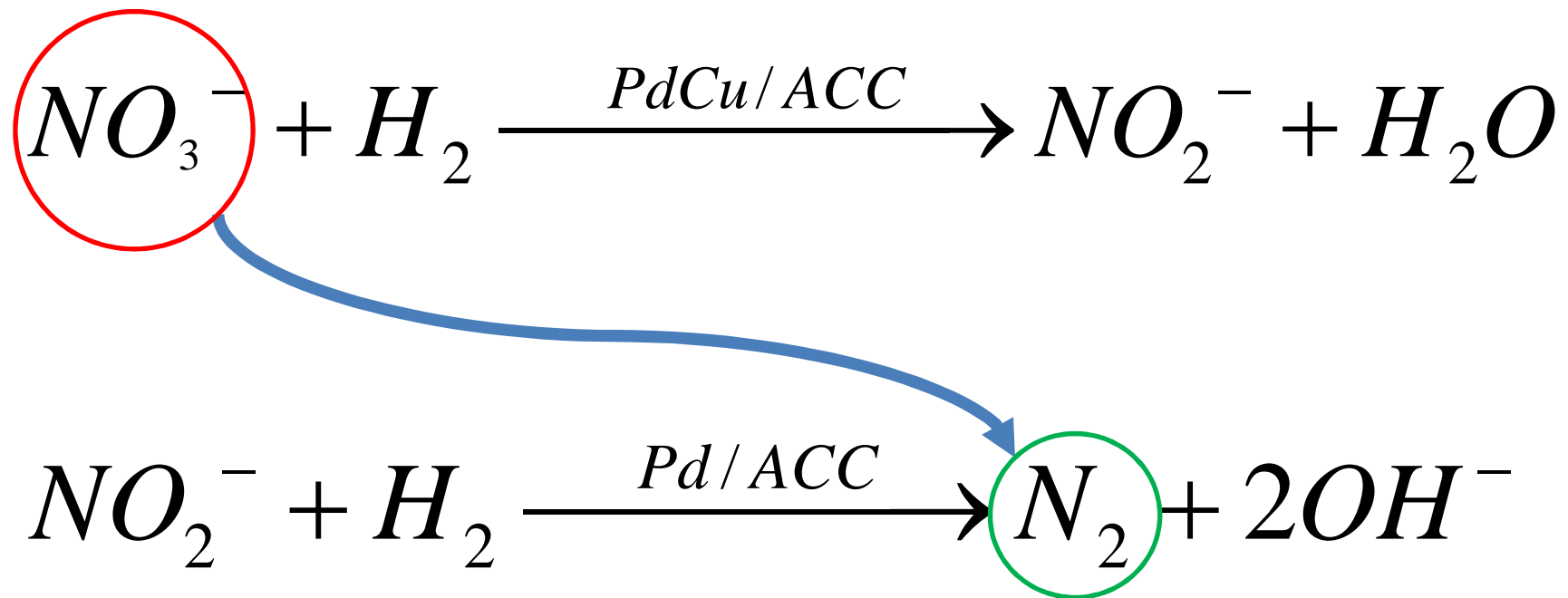
# Treatment Options: Nitrate Removal



# Treatment Options: Nitrate Reduction



Using:  
Catalytic Reduction Technology

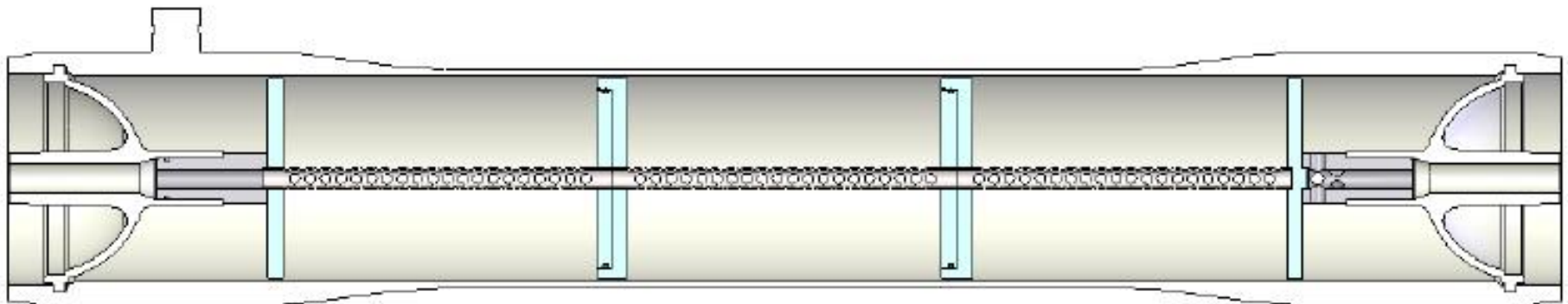


**Our Innovation:**  
The Use of  
Activated Carbon Cloth  
as the Catalyst Support.

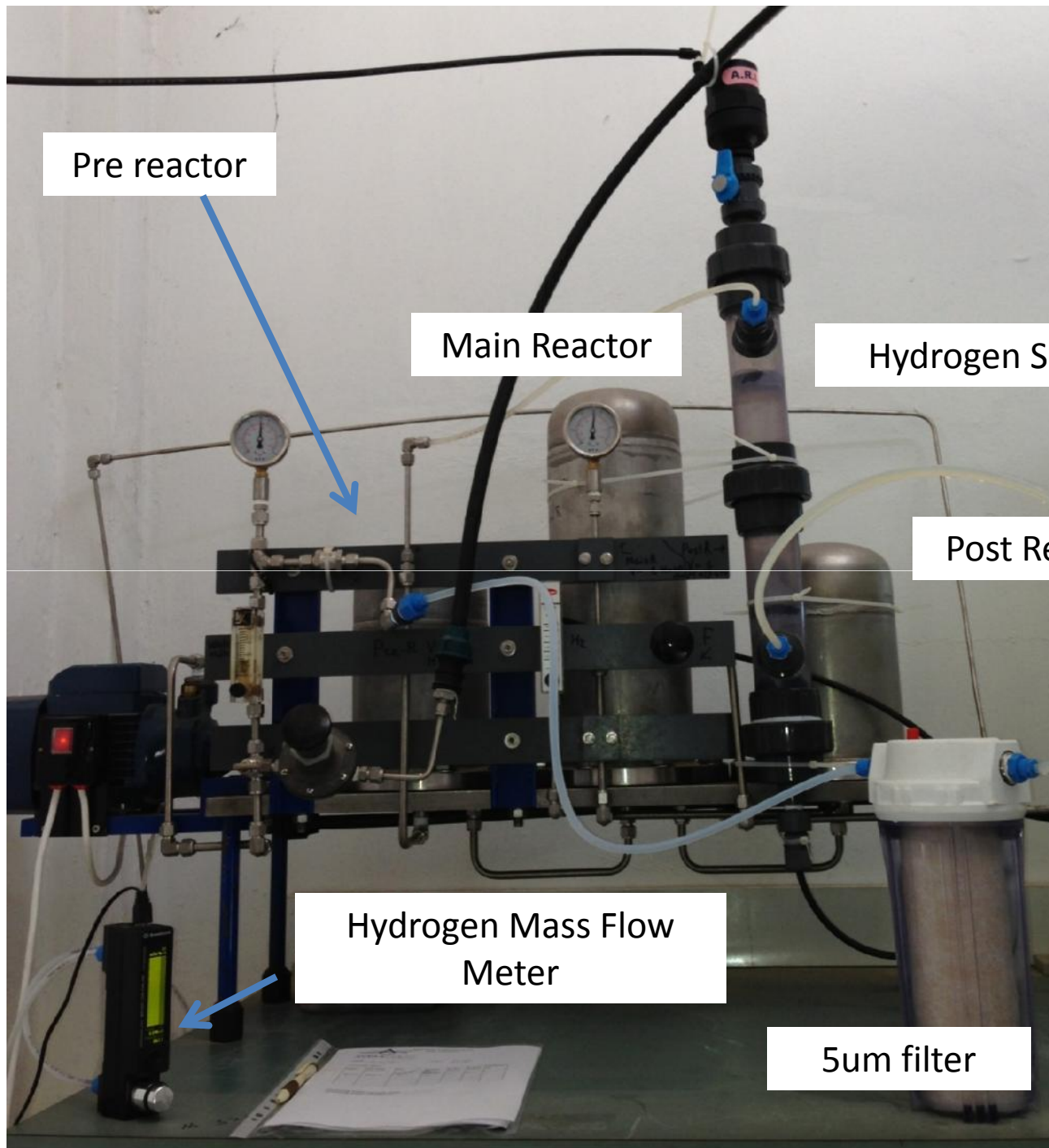




A **Standard** RO Pressure Vessel is Used as the Reactor. The Catalyst Modules Fit in the Vessel like **RO Membranes**.

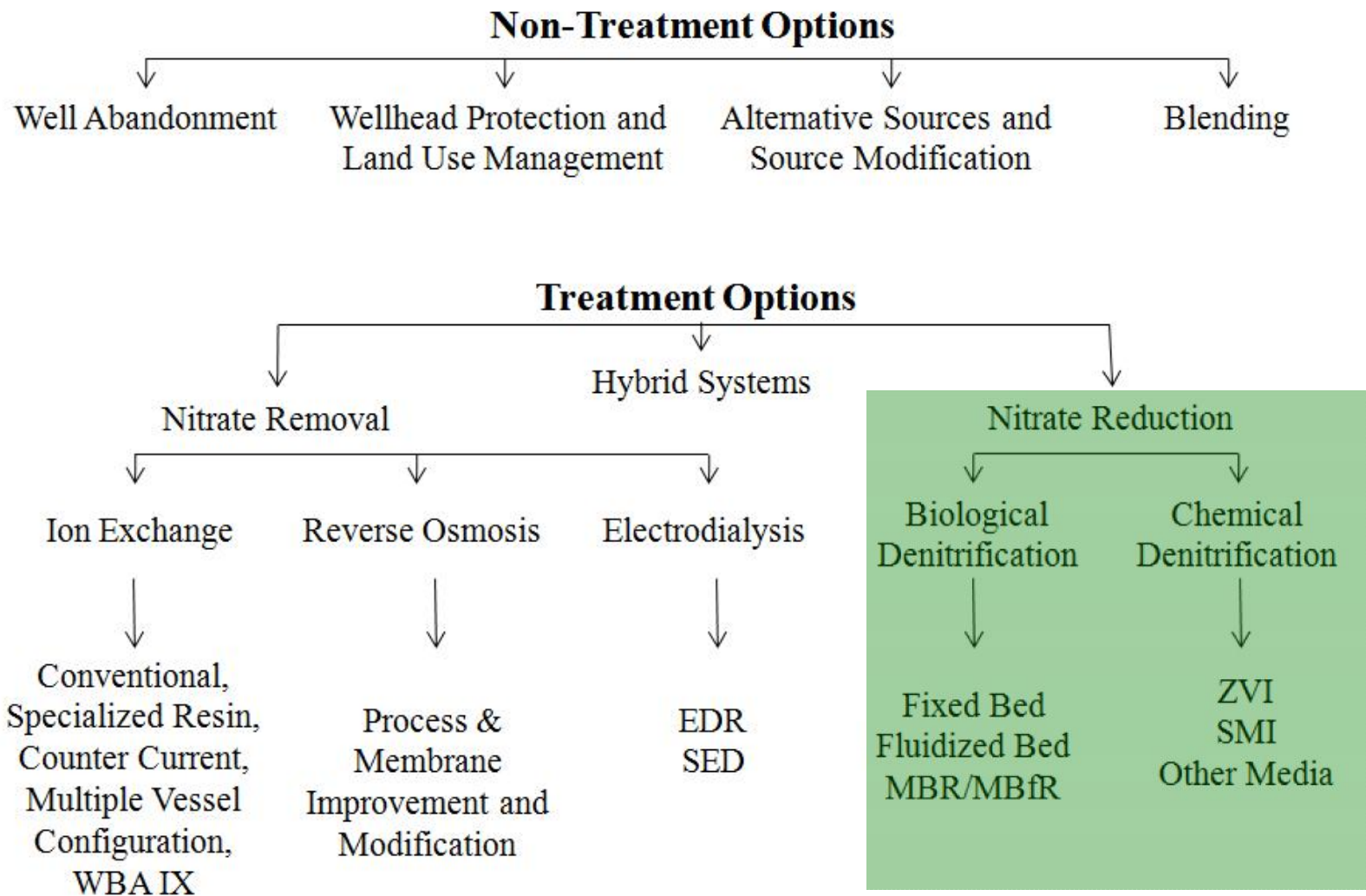






Pilot System  
In a  
Contaminated  
Well In Israel

# Treatment Options: Nitrate Reduction





# Photocatalytic Reduction

- Doudrick, K.; Monzón, O.; Mangonon, A.; Hristovski, K.; Westerhoff, P. K., Nitrate Reduction in Water Using Commercial Titanium Dioxide Photocatalysts (P25, P90, and Hombikat UV100). *ASCE J. of Environ. Eng.*, 138(8), 852–861, 2012.



# Summary of Nitrate Management Options

